

The Butchering Art: Joseph Lister's Quest to Transform the Grisly World of Victorian Medicine
LINDSEY FITZHARRIS
Scientific American/
Farrar, Straus and
Giroux: 2017.

enter this harrowing world? As Fitzharris shows, it was mostly down to his powerful sense of service to humanity, and passion for natural sciences. Medicine married the two. Lister was exposed to science early on, through his father Joseph Jackson Lister, a wine merchant and keen microscopist who was eventually elected a Fellow of the Royal Society. The younger Lister arrived at University College

London in 1844 with one of his father's microscopes, a much better instrument than his teachers had. Throughout his career, his scientific interests and meticulous microscopic examination of tissues — living, diseased and dead — distinguished his practice.

Initially, Lister focused on the management of surgical wounds, striving to understand normal healing and develop new ways of treating and monitoring post-operative patients. He routinely examined recovering wounds, taking samples and experimenting with dressings. Most surgeons, who regarded infection as unavoidable, scoffed. But Lister was not alone. Oliver Wendell Holmes in Boston, Massachusetts, and Ignaz Semmelweis in Vienna and Budapest also accumulated evidence in favour of it.

Fitzharris notes that a turning point came in 1864, when Lister discovered the work of Louis Pasteur on the microorganisms that cause fermentation and putrefaction. Lister believed that air-borne organisms could infect wounds, and realized that precautionary treatment might destroy them. After much experimentation, he heard that engineers used carbolic acid to reduce the smell from rotting waste. Tests led him to conclude that this was a perfect antiseptic for instruments, clothes and hands, and, diluted with olive oil, for the treatment of wounds. He designed an atomizer to maintain a fine mist of it throughout operations. Many professionals derided his methods, and some considered them quackery; others failed to follow

HEALTH

The war on germs

Tilli Tansey hails a history of Joseph Lister's drive to vanquish post-operative infection and putrefaction.

With antimicrobial resistance becoming a real threat in routine surgery, it is salutary to contemplate the early Victorian operating theatre. Pain and death were the norm, the surgical brutality matched by the torments of post-operative infection and putrefaction. In *The Butchering Art*, medical historian Lindsey Fitzharris ushers us into that realm.

Fitzharris's focus is the work of surgeon and medical researcher Joseph Lister (1827–1912) in developing and promoting antiseptic surgery. In the early nineteenth century, London, Edinburgh and other British cities had built large municipal hospitals to treat the poor. Operating theatres were arenas in which the spectacle of life and death was often viewed by a jostling crowd.

As Fitzharris vividly relates, the patient was strapped to an operating table bearing residues of earlier procedures. The surgeon wore street clothes, or an ancient, blood-encrusted

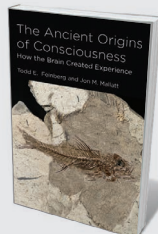
apron. Although instruments might be sharpened for swifter slicing, they (and surgeons' hands) were rarely washed. One famous, possibly apocryphal account of an operation by surgeon Robert Liston recorded a 300% mortality rate. The patient died; an assistant, fingers sliced off during high-speed surgery, died of gangrene; and an observer had a fatal heart attack.

Large urban hospitals had higher mortality rates than country practices. Four major infections were accepted as largely inevitable: septicaemia, erysipelas, gangrene and pyaemia. There was disagreement about the causes. One theory blamed the circulation of 'miasma', or 'bad air'; the other centred on contagion, the transmission of some poison. Rudimentary anaesthesia, first used in Britain in 1846, actually increased mortality rates for some years; surgeons performed ever-bolder operations, with no way to control infection.

Why would Lister, a serious and sensitive Quaker with an aptitude for the arts, want to

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The Ancient Origins of Consciousness: How the Brain Created Experience

Todd E. Feinberg and Jon M. Mallatt (MIT Press, 2017)

Psychiatrist Todd Feinberg and biologist Jon Mallatt draw on evolution, neurobiology and philosophy to trace the roots of consciousness back some 540 million years to the 'Cambrian explosion' in animal diversity. Comparing vertebrates and invertebrates, they chart the evolution of sense, memory and consciousness since the birth of complex brains, and explore questions such as whether fish feel pain, and which sense developed first: sight or smell?

Lister's instructions and could not replicate his results. The eminent surgeon James Paget's 1869 declaration in *The Lancet* that Lister's system was "no good" was damning.

However, Lister's reputation in Britain was ultimately sealed by one high-profile patient: Queen Victoria. By 1871, he was the most renowned surgeon in Scotland, and successfully treated his royal patient for a large underarm abscess at Balmoral Castle. In 1876, Lister demonstrated his technique at the International Medical Congress in Philadelphia, Pennsylvania, convincing many US sceptics. Massachusetts General Hospital, which had banned his methods for years, became the first US hospital to endorse their use.

Lister received numerous honours and awards: a peerage, the Order of Merit and presidency of the Royal Society. Moreover, Britain began to obsess over cleanliness. The flourishing commercial companies of the late nineteenth century rushed to make products to satisfy the trend, including carbolic smoke balls (for nasal inhalation, to flush out infections), fumigators, soaps and the enduring oral antiseptic Listerine. Lister's place in the history of surgery was assured. Widespread adoption of his techniques exemplified the acceptance of germ theory; in time, there was a shift from antiseptics (germ-killing) to asepsis (germ-free). Ironically, as Fitzharris reveals, Lister resisted this: he believed that asepsis would be impossible in the home, where the wealthy and middle classes were treated. He failed to realize that he had sown the seeds for the rise of the hospital as a place for the specialist care of all, not just the poor.

The Butchering Art is well researched and written with verve. Fitzharris takes some licence with speculative conversations, thoughts and emotions, and a few anachronisms irk. For example, University College (called the modern 'UCL' throughout) did not have a 'campus'; neither did nineteenth-century physicians see non-hospital patients in their 'offices'. Nevertheless, this is a fine read full of vivid detail, prompting thoughtful reflection on the past, and the challenging future, of surgical practice. ■

Tilli Tansey is emeritus professor of medical history and pharmacology at Barts and The London, Queen Mary University of London. e-mail: t.tansey@qmul.ac.uk

SUSTAINABILITY

China's path to ecotopia

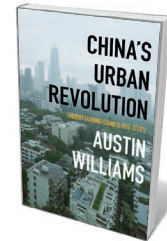
Xuemei Bai critiques a critique of the country's eco-city initiative.

It's easy to get a sense of China's rapid urbanization: overwhelming numbers and breathtaking images abound. In 40 years, the country's urban population has quadrupled to about 800 million, and its cities have tripled in number, to 657. To seek urban development with better economic, environmental and social outcomes, China has introduced many branding and accrediting schemes.

One is the eco-city. By 2016, at least 220 cities, towns, prefectures and districts had received the national accreditation for their socio-economically beneficial and ecologically 'clean' features such as renewable energy and water recycling. There is so much information on China's urban mosaic that it's hard to make sense of it.

In *China's Urban Revolution*, architect and writer Austin Williams attempts to do so, probing the country's eco-city experiment against the background of its socio-economic realities. The speed of change in China makes it extremely challenging to grasp what is happening and why: the social and political context can lose relevance rapidly, and so become risky to reference in as little as a decade. Williams should be commended for trying. He promises a nuanced view that is neither sinocentric nor biased towards the West — enticing for those who seek insights beyond blind criticism or blind optimism.

Unfortunately, the book falls short of this promise. Williams asserts that it is a "political assessment" of China's eco-urban initiatives, and that his exploration may "give rise to a number of contradictory viewpoints".



China's Urban Revolution: Understanding Chinese Eco-Cities
AUSTIN WILLIAMS
Bloomsbury Academic: 2017.

His perspectives are indeed often contradictory, sometimes drastically.

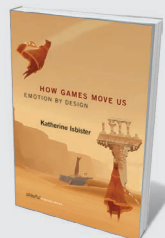
Williams declares that the concept of the eco-city is ill-defined. That is fair. He then says that this vagueness allows China to misrepresent itself as the eco-city capital of the world. Some of his criticisms are just, and are reflected in

China. Several high-profile planned eco-cities, such as Dongtan near Shanghai, are still unbuilt; projects can end up as box-ticking; development may take priority over sustainability. However, Williams often interprets local malpractices or failures as pertaining to China as a whole, and links them to perceived underlying politics. What I miss is a serious critique on why projects fail, and what can be learnt. The book bolts anecdotes and fragmented (but valuable) facts into sweeping political or ideological conclusions, often without in-depth analysis.

Williams looks at Chinese eco-cities and their contexts through the lens of Western environmental thinking. He

compares progressive Western scholarship on sustainability (such as biologist Rachel Carson's work in the 1960s) with mainstream practice in China at the time, and frames it as the West vs China. In truth, disparities between theory and practice ▶

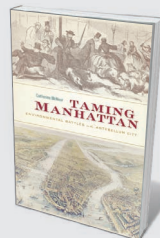
ECO-CITIES ARE ABOUT RECOGNIZING PROCESS AND EFFORT.



How Games Move Us: Emotion by Design

Katherine Isbister (MIT Press, 2017)

Games researcher Katherine Isbister offers fascinating insights into the ways in which designers trigger players' emotions. The ability to customize characters' appearance and personality in *The Sims*, for example, encourages players to form virtual attachments to the avatar.



Taming Manhattan

Catherine McNear (Harvard Univ. Press, 2017)

Before the American Civil War, Manhattan was awash in manure and sewage, and teeming with wild dogs. Catherine McNear's absorbing history traces how New York City was tamed through urban planning, yet plagued afterwards by social tensions and environmental pressures.